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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,631	11/25/2003	Henry A. Blauvelt	XPNT31NP	7735

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EXAMINER

LEE, JOHN D

ART UNIT	PAPER NUMBER
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2874

DATE MAILED: 01/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/721,631	Applicant(s) BLAUVELT ET AL.	
	Examiner John D. Lee	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 48-55 is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-19, 21-33, 35-43 and 45-47 is/are rejected.
- 7) ☒ Claim(s) 10, 20, 34 and 44 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1205</u> . | 6) <input type="checkbox"/> Other: _____ |


A request for continued examination under 37 C.F.R. § 1.114, including the fee set forth in 37 C.F.R. § 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 C.F.R. § 1.114, and the fee set forth in 37 C.F.R. § 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 C.F.R. § 1.114. Applicant's submission filed on December 23, 2005, has been entered.

The objections set forth in the previous Office action (paper number 0905, mailed September 23, 2005) have been obviated by the submission filed on December 23, 2005. The Information Disclosure Statement filed on December 23, 2005, has been carefully considered by the Examiner, and one of the references listed therein has been found to be extremely pertinent to the pending claims. Accordingly, the finding of allowability set forth in the previous Office action is hereby withdrawn and appropriate rejections are set forth below.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in – (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4-7, 9, 11, 13,  15, 16, 18, 19, 21, 22, 24, 25, 27-30, 33, 35, 37, 39, 40, 42, 43, 45, and 46 are rejected under 35 U.S.C. § 102(e) as being clearly anticipated by U.S. Patent 6,885,795 to Hsu et al. Hsu et al discloses an optical apparatus (and method of forming it) comprising a bottom surface **26** and walls **28**, **30**, etc. formed on a first substrate **20** and substantially defining a detection volume **32** and an upper opening thereof (see Figures 1A, 1B, 1C). An optical waveguide **12**, parallel to the substrate **20**, has an end face which is positioned so that light emerging from the end face enters the detection volume. A photodetector **34** (which can have an active area on a detector substrate – see column 5, lines 9-18) is mounted so as to cover the upper opening of the detection volume with the active area exposed thereto. The fact that portion **32** of Hsu et al is a detection “volume” is supported by column 4 (lines 61-64) of Hsu et al, which specifies that the medium of portion **32** can be “air”. The side views of the Hsu et al device clearly show that the walls **28**, **30**, etc. formed at least in part by ridges protruding from the substrate **20**, and that the waveguide **12** is formed on the substrate **20**. The silicon-on-insulator construction of the Hsu et al apparatus indicates that the walls of the detection volume are formed at least in part by material used to form the cladding or core of the optical waveguide **12**. Since a cladding always surrounds the core of the waveguide, when the walls are formed from the same material as the core, there will be a “non-contiguous” property between the core and the walls (i.e. the cladding material will intervene at some point). As seen in Figure 1A of Hsu et al, light emerging from the end face of waveguide **12** enters the detection volume **32** through a passage through one of the walls thereof. Figure 1D of Hsu et al shows that reflective coatings (e.g. aluminum)

can be applied to inner wall surfaces and the bottom surface. Note also that the detection volume **32** can be filled with an optically transparent material such as epoxies or polymers (column 4, lines 61-64). This would include liquid epoxies or polymers. The use of such filling epoxies or polymers results in substantial sealing of the detector substrate over the upper opening of the detection volume **32**. Figure 1C of Hsu et al shows that photodetector **34** rests on a substantially flat substantially contiguous upper mounting surface surrounding the upper opening of the detection volume **32** and there is consequently a substantial seal to the volume **32**. Notice in Figure 1C of Hsu et al that at least a portion of an inner face of the walls is tilted upward (and thus reduces optical feedback into waveguide **12**).

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 8, 12, 14, 17, 23, 26, 31, 32, 36, 38, 41, and 47 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,885,795 to Hsu et al. As noted above, the walls **28**, **30**, etc. of the Hsu et al apparatus are formed at least in part by ridges protruding from the substrate **20**. Since such walls could be defined by any boundary structure which differs in height from the substrate **20**, an “inverse” sunken structure (wherein the walls are formed at least in part by a recessed area in the substrate) would have been an obvious alternative to the walled enclosure shown in the reference. Also as noted above, the waveguide **12** of Hsu et al is formed directly on the substrate **20**.

In order to allow the fabrication of the waveguide separately from the remainder of the apparatus (in order to accurately tailor the light transmitting properties thereof), it would have been obvious to form the Hsu et al waveguide **12** on a separate waveguide substrate, and then mount the waveguide/waveguide substrate on the first substrate **20**. Only ordinary skill in the art would be involved. The reflective (e.g. aluminum) coatings shown in Hsu et al appear only on wall or substrate surfaces. The placement of such coatings on other surfaces, such as the end face of the waveguide where light enters the volume **32**, in order to prevent deleterious back-reflections into the waveguide, would have been obvious to a person of ordinary skill in the art. The precise mechanism for admitting the filling optically transparent material such as epoxies or polymers into the volume **32** of Hsu et al is not made clear. Any known mechanism would thus have been obvious, including a small passage through at least one wall of the detection volume. As noted above, Figure 1C of Hsu et al shows that photodetector **34** rests on a substantially flat substantially contiguous upper mounting surface surrounding the upper opening of the detection volume **32**. It is possible, however, that there would be gaps between the abutting portions of the four walls upon which the photodetector rests. In this case, it would have been obvious to ensure that such gaps were filled with the optically transparent material such as epoxies or polymers so that the volume **32** is substantially completely sealed. Hsu et al does not illustrate the tilting of the end face of the waveguide **12** downward, but this would have been obvious, especially when the bottom surface of the volume **32** is reflectively coated. Such downward tilting would still serve to prevent back-reflections into the waveguide, and light emerging from the waveguide end face would still be reflected toward the photodetector **34**. With respect to the

limitation of claim 31, this “plural unit” embodiment would have been obvious to the person of ordinary skill in the art, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Co. v. Bemis Co.*, 193 USPQ 8 (CA7 1977).

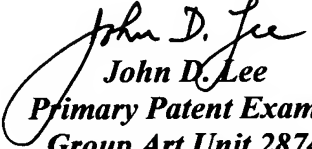
Claims 10, 20, 34, and 44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Hsu et al, the closest prior art document of record, does not disclose or suggest that light emerging from the end face of the waveguide 12 may enter the detection volume 32 through a substantially transparent segment of one of the walls. Hsu et al further does not disclose or suggest that the aluminum reflective coating 40 on the bottom surface of the detection volume 32 (Figure 1D) could serve as an electrical contact for the active area of the detector substrate.

Claims 48-55 are allowable over the prior art of record. Neither Hsu et al nor any other prior art document of record discloses or suggests an optical apparatus like that claimed, wherein a *semiconductor laser* is formed on a substrate to emit light into a detection volume formed by walls on the substrate and a photodetector covering the upper opening thereof.

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (571) 272-2351. The Examiner’s normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562,

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to the technical support staff supervisor (Team 8) at telephone number (571) 272-1564, or
to the Technology Center 2800 Customer Service Office at telephone number (571) 272-
1626.


John D. Lee
Primary Patent Examiner
Group Art Unit 2874